

# Adikavi Nannaya University

## B.Sc. Computer Science/Information Technology (IT) Syllabus Under CBCS

w.e.f.2015-2016 (Modified in April 2016)

### Structure of Computer Science/Information Technology (IT) Syllabus

Semester	Paper	Subject	Hrs.	Credits	I A	ES	Total	
<b>FIRST YEAR</b>								
<b>SEMESTER VI</b>	<b>VII (A/B/ C) *</b>	<b>Elective-I</b>						
		A. Operating Systems	3	3	25	75	100	
		Operating Systems Lab	3	2	0	50	50	
		B. Computer Networks	3	3	25	75	100	
		Computer Networks Lab	3	2	0	50	50	
		C. Web Technologies	3	3	25	75	100	
	Web Technologies Lab	3	2	0	50	50		
	<b>VIII ** Cluster – A- A1,A2 or Cluster-B- B1,B2 Or Cluster – C – C1,C2</b>	<b>Elective-II(Cluster A)</b>						
		A1. Foundations of Data Science	3	3	25	75	100	
		Foundations of Data Science Lab (through R)	3	2	0	50	50	
		A2. Big Data Technology	3	3	25	75	100	
		Big Data Technology Lab (Hadoop)	3	2	0	50	50	
		<b>Elective-II(Cluster B)</b>						
		B1. Distributed Systems	3	3	25	75	100	
		Distributed Systems Lab	3	2	0	50	50	
		B2. Cloud Computing	3	3	25	75	100	
		Cloud Computing Lab	3	2	0	50	50	
		<b>Elective-II(Cluster C)</b>						
		C1. PHP – MySql & Wordpress	3	3	25	75	100	
		PHP-MySql & Wordpress Lab	3	2	0	50	50	
C2. Advanced JavaScript : JQuery, Ajax, Angular JS & JSON		3	3	25	75	100		
Advanced JavaScript Lab	3	2	0	50	50			
	<b>Project – 2</b>	5	5	25	75	100		

**\*Candidate has to choose only one paper**

**\*\* Candidates are advised to choose Cluster (A) if they have chosen VII (A) and Choose Cluster (B) if they have chosen VII(B) etc. However, a candidate may choose any cluster irrespective of what they have chosen in paper VII**

**Structure of Computer Science/Information Technology (IT) Syllabus**

**III YEAR VI SEMESTER**

**Paper-VII: Elective-A**

**Operating Systems**

**Course Objectives**

1. To understand the services provided by and the design of an operating system.
2. To understand the structure and organization of the file system.
3. To understand what a process is and how processes are synchronized and scheduled.
4. To understand different approaches to memory management.
5. Students should be able to use system calls for managing processes, memory and the file system.

**Course Outcomes**

1. Analyze the concepts of processes in operating system and illustration of the scheduling of processor for a given problem instance.
2. Identify the dead lock situation and provide appropriate solution so that protection and security of the operating system is also maintained.
3. Analyze memory management techniques, concepts of virtual memory and disk scheduling.
4. Understand the implementation of file systems and directories along with the interfacing of IO devices with the operating system.

**UNIT - I**

**Operating System Introduction:** Operating Systems Objectives and functions, Computer System Architecture, OS Structure, OS Operations, Evolution of Operating Systems - Simple Batch, Multi programmed, time shared, Parallel, Distributed Systems, Real-Time Systems, Operating System services.

**UNIT - II**

Process and CPU Scheduling - Process concepts - The Process, Process State, Process Control Block, Threads, Process Scheduling - Scheduling Queues, Schedulers, Context Switch, Preemptive Scheduling, Dispatcher, Scheduling Criteria, Scheduling algorithms, Case studies: Linux, Windows.

Process Coordination - Process Synchronization, The Critical section Problem, Synchronization Hardware, Semaphores, and Classic Problems of Synchronization, Monitors, Case Studies: Linux, Windows.

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### **UNIT - III**

Memory Management and Virtual Memory - Logical & physical Address Space, Swapping, Contiguous Allocation, Paging, Structure of Page Table. Segmentation, Segmentation with Paging, Virtual Memory, Demand Paging, Performance of Demanding Paging, Page Replacement Page Replacement Algorithms, Allocation of Frames.

### **UNIT - IV**

File System Interface - The Concept of a File, Access methods, Directory Structure, File System Mounting, File Sharing, Protection, File System Structure,

Mass Storage Structure - Overview of Mass Storage Structure, Disk Structure, Disk Attachment, Disk Scheduling.

### **UNIT - V**

Deadlocks - System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection and Recovery from Deadlock.

### **REFERENCES BOOKS:**

1. Operating System Principles, Abraham Silberchatz, Peter B. Galvin, Greg Gagne 8th Edition, Wiley Student Edition.
2. Principles of Operating Systems by Naresh Chauhan, OXFORD University Press
3. Operating systems - Internals and Design Principles, W. Stallings, 6th Edition, Pearson.
4. Modern Operating Systems, Andrew S Tanenbaum 3rd Edition PHI.
5. Operating Systems A concept - based Approach, 2nd Edition, D. M. Dhamdhare, TMH.
6. Principles of Operating Systems, B. L. Stuart, Cengage learning, India Edition.
7. Operating Systems, A. S. Godbole, 2nd Edition, TMH

### **Student Activity:**

- 1. Load any new operating system into your computer.**
- 2. Partition the memory in your system**
- 3. Create a semaphore for process synchronization**

**Structure of Computer Science/Information Technology (IT) Syllabus**

**III YEAR VI SEMESTER**

**Paper-VII: Elective-A**

**Operating Systems Lab**

**Objectives:**

- To use linux operating system for study of operating system concepts.
- To write the code to implement and modify various concepts in operating systems

**Outcomes:**

- The course objectives ensure the development of students applied skills in operating systems related areas.
- Students will gain knowledge in writing software routines modules or implementing various concepts of operating system.

**List of Experiments:**

1. Usage of following commands  
Ls,pwd,ty,cat,who,who am I,rm, mkdir,rmdir,touch,cd.
2. Usage of following commands  
Cal,cat(append),cat(concatenate),mv,cp,man,date.
3. Usage of following commands  
Chmod,grep,tput(clear,highlight),bc.
4. Write a shell script to check if the number entered at the command line is Prime or not.
5. Write a shell script to modify “cal” command to display calendars of the specified months.
6. Write a shell script to modify “cal” command to display calendars of the specified range of months.
7. Write a shell script to accept a login name. If not a valid login name display message “entered login name is invalid”
8. Write a shell script to display date in the mm/dd/yy format.
9. To implement the FCFS Algorithm.
10. To implement the shortest job First Algorithm.
11. To implement the priority algorithm.
12. To implement the round robin Algorithm.
13. To implement the FIFO page replacement algorithm

14. To implement the LRU page replacement Algorithm.
14. To implement the Resource request Algorithm.
15. To implement the First-Fit, Best-Fit, Worst-Fit Algorithm.
16. To implement the sequential file organization.
17. To implement the Random file organization
  
18. Simulate Page Replacement Algorithms FIFO
19. Simulate Page Replacement Algorithms LRU
21. Simulate Page Replacement Algorithms OPTIMAL
22. Simulate Algorithm For Deadlock Prevention

**Structure of Computer Science/Information Technology (IT) Syllabus**

**III YEAR VI SEMESTER**

**Paper-VII: Elective-B**

**COMPUTER NETWORKS**

**Course Objectives**

1. To provide an introduction to the fundamental concepts on data communication and the design of computer networks.
2. To get familiarized with the basic protocols of computer networks.

**Course Outcomes**

After this course, the student will be able to

1. Identify the different components in a Communication System and their respective roles.
2. Describe the technical issues related to the local Area Networks
3. Identify the common technologies available in establishing LAN infrastructure.

**UNIT – I**

**Introduction:** Uses of Computer Networks, Network Hardware, Network Software, Reference Models, Example Networks.

**The Physical Layer:** The Theoretical Basis for Data Communication, Guided Transmission Media, Wireless transmission, the public switched telephone network

**UNIT – II**

**The Data Link Layer:** Data Link Layer Design Issues, Error Detection and Correction, Sliding Window Protocols.

**The Medium Access Control Sub-layer:** The channel allocation problem, **Multiple Access Protocols, Ethernet**, Data Link Layer Switching.

**UNIT – III**

**The Network Layer:** Network Layer Design Issues, Routing Algorithms, Congestion control algorithms, Quality of Service.

Internet Working, The Network Layer in the Internet

## **UNIT – IV:**

**The Transport Layer:** The Transport Service, Elements of Transport Protocols, Congestion Control Algorithms, The Internet Transport Protocols, The Internet Transport Protocols: TCP, Delay Tolerant Networks.

## **UNIT – V:**

**The Application Layer:** DNS – The Domain Name System, Electronic Mail, The World Wide Web, Real Time Audio & Video, Content Delivery & Peer-to-Peer.

## **Reference Books:**

1. Andrew S. Tanenbaum, “Computer Networks”, Fifth Edition, Pearson Education.
2. Bhushan Trivedi, Computer Networks , Oxford University Press
3. James F.Kurose, Keith W.Ross, “Computer Networking”, Third Edition, Pearson Education
4. Behrouz A Forouzan, “Data Communications and Networking”, Fourth Edition, TMH (2007).
5. Kurose & Ross, “**COMPUTER NETWORKS**” – A Top-down approach featuring the Internet”, Pearson Education – Alberto Leon – Garciak.

## **Student Activity:**

1. **Study the functioning of network devices available in your organization .**
2. **Prepare a pictorial chart of LAN connections in your organization**

## III YEAR VI SEMESTER

### Paper-VII: Elective-B

#### COMPUTER NETWORKS LAB

##### **OBJECTIVES:**

1. Analyze the different layers in networks.
2. Define, use, and differentiate such concepts as OSI-ISO,TCP/IP.
3. How to send bits from physical layer to data link layer
4. Sending frames from data link layer to Network layer
5. They can understand how the data transferred from source to destination
6. They can come to know that how the routing algorithms worked out in network layer

##### List of Experiments:

1. Analyze the different layers in networks.
2. Define, use, and differentiate such concepts as OSI-ISO,TCP/IP.

##### **List of Experiments:**

1. Write a program to implement data link layer framing method bit stuffing.
2. Write a program to implement data link layer framing method character stuffing.
3. Write a program to implement data link layer framing method character count.
4. Write a program to implement Cyclic Redundancy Check (CRC 12, CRC 16 and CRC CCIR) on a data set of characters.
5. Write a program to implement Dijkstra's algorithm to compute the shortest path through a graph.
6. Write a program to implement subnet graph with weights indicating delay between
7. Write a program to implement subnet



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**Structure of Computer Science/Information Technology (IT) Syllabus**

**III YEAR VI SEMESTER**

**Paper-VII : Elective-C**

**Web Technologies**

**Course Objective**

To provide knowledge on web architecture, web services, client side and server side scripting technologies to focus on the development of web-based information systems and web services.

To provide skills to design interactive and dynamic web sites.

**Course Outcome**

1. To understand the web architecture and web services.
2. To practice latest web technologies and tools by conducting experiments.
3. To design interactive web pages using HTML and Style sheets.
4. To study the framework and building blocks of .NET Integrated Development Environment.
5. To provide solutions by identifying and formulating IT related problems.

**UNIT – I**

**HTML:** Basic HTML, Document body, Text, Hyper links, adding more formatting, Lists, Tables using images. More HTML: Multimedia objects, Frames, Forms towards interactive, HTML document heading detail

**UNIT – II**

Cascading Style Sheets: Introduction, using Styles, simple examples, your own styles, properties and values in styles, style sheet, formatting blocks of information, layers.

**UNIT – III**

Introduction to JavaScript: What is DHTML, JavaScript, basics, variables, string manipulations, mathematical functions, statements, operators, arrays, functions. Objects in JavaScript: Data and objects in JavaScript, regular expressions, exception handling

**UNIT – IV**

DHTML with JavaScript: Data validation, opening a new window, messages and confirmations, the status bar, different frames, rollover buttons, moving images,

**UNIT – V**

XML: defining data for web applications, basic XML, document type definition, presenting XML, document object model. Web Services

## References:

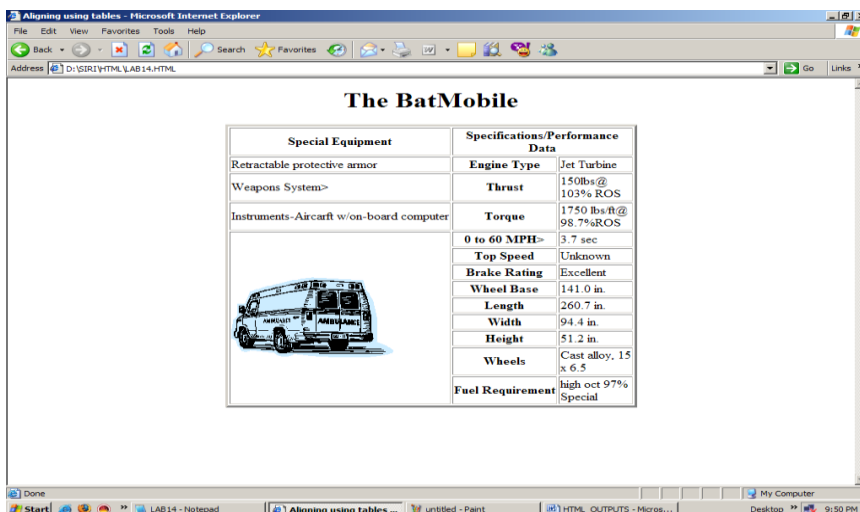
1. Harvey M. Deitel and Paul J. Deitel, “Internet & World Wide Web How to Program”, 4/e, Pearson Education.
2. Uttam Kumar Roy, Web Technologies from Oxford University Press

## Student Activities:

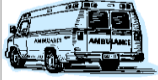
1. Prepare a web site for your college
2. Prepare your personal website

## Paper-VII : Elective-C Web Technologies Lab

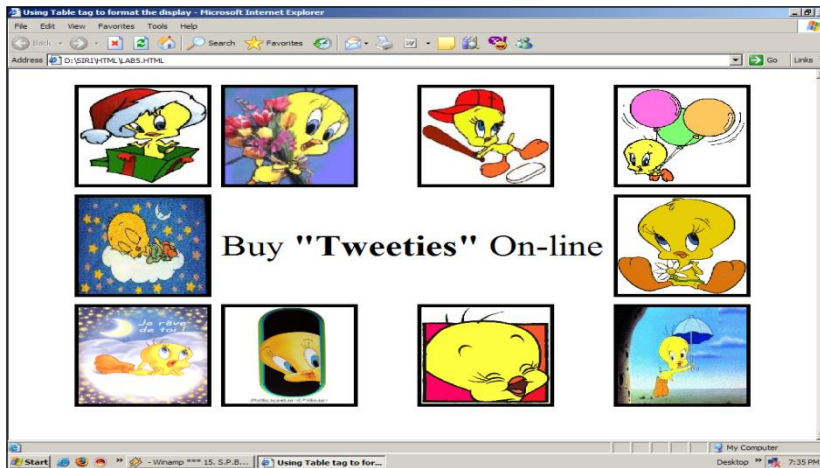
1. Write a HTML program illustrating text formatting.
2. Illustrate font variations in your HTML code.
3. Prepare a sample code to illustrate links between different sections of the page.
4. Create a simple HTML program to illustrate three types of lists.
5. Embed a calendar object in your web page.
6. Create an applet that accepts two numbers and perform all the arithmetic operations on them.
7. Create nested table to store your curriculum.
8. Create a form that accepts the information from the subscriber of a mailing system.
9. Design the page as follows:



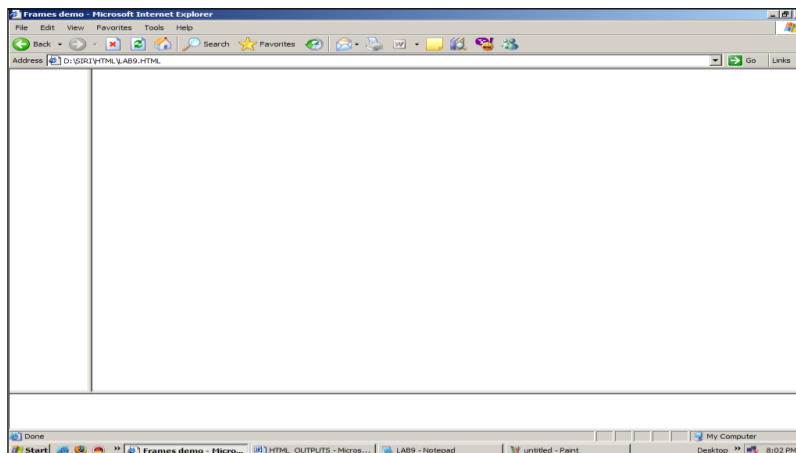
The screenshot shows a Microsoft Internet Explorer browser window displaying a web page titled "The BatMobile". The page content is as follows:

Special Equipment	Specifications/Performance Data
Retractable protective armor	<b>Engine Type</b> Jet Turbine
Weapons System>	<b>Thrust</b> 150lbs@ 103% ROS
Instruments-Aircraft w/on-board computer	<b>Torque</b> 1750 lbs-ft@ 98.7%ROS
	<b>0 to 60 MPH&gt;</b> 3.7 sec
	<b>Top Speed</b> Unknown
	<b>Brake Rating</b> Excellent
	<b>Wheel Base</b> 141.0 in.
	<b>Length</b> 260.7 in.
	<b>Width</b> 94.4 in.
	<b>Height</b> 51.2 in.
	<b>Wheels</b> Cast alloy, 15 x 6.5
	<b>Fuel Requirement</b> high oct 97% Special

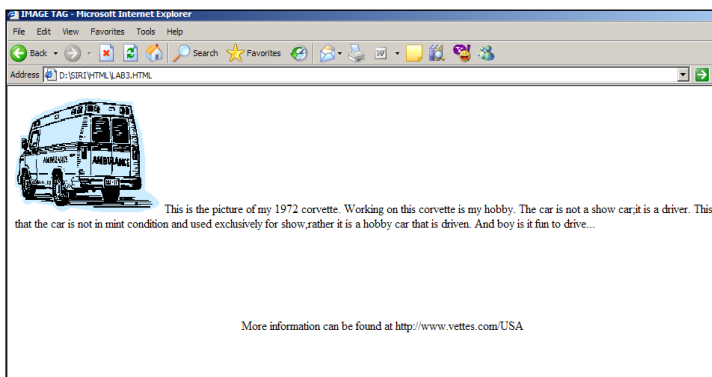
**11. Using "table" tag, align the images as follows:**



**12. Divide the web page as follows:**

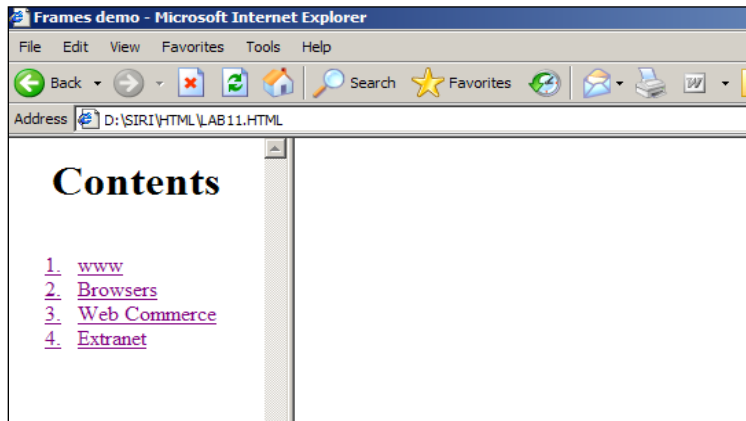


**13. Design the page as follows:**



14. Illustrate the horizontal rulers in your page.

15. Create a help file as follows:



16. Create a form using form tags(assume the form and fields).

17. Create a webpage containing your biodata(assume the form and fields).

18. Write a html program including style sheets.

20. Write a html program to layers of information in web page.

21. Create a static webpage.

**Structure of Computer Science/Information Technology (IT) Syllabus**

**III YEAR VI SEMESTER**  
**(Cluster 1) Paper-VIII: Elective –A-1**  
**Foundations of Data Science**

**Course Objectives**

Modern scientific, engineering, and business applications are increasingly dependent on data, existing traditional data analysis technologies were not designed for the complexity of the modern world. Data Science has emerged as a new, exciting, and fast-paced discipline that explores novel statistical, algorithmic, and implementation challenges that emerge in processing, storing, and extracting knowledge from Big Data.

**Course Outcomes**

1. Able to apply fundamental algorithmic ideas to process data.
2. Learn to apply hypotheses and data into actionable predictions.
3. Document and transfer the results and effectively communicate the findings using visualization techniques.

**UNIT I**

**INTRODUCTION TO DATA SCIENCE** :Data science process – roles, stages in data science project – working with data from files – working with relational databases – exploring data – managing data – cleaning and sampling for modelling and validation – introduction to NoSQL.

**UNIT II**

**MODELING METHODS** :Choosing and evaluating models – mapping problems to machine learning, evaluating clustering models, validating models – cluster analysis – K-means algorithm, Naïve Bayes – Memorization Methods – Linear and logistic regression – unsupervised methods.

**UNIT III**

**INTRODUCTION TO R Language**: Reading and getting data into R – ordered and unordered factors – arrays and matrices – lists and data frames – reading data from files.

## UNIT IV

**PROBABILITY DISTRIBUTIONS** in R - Binomial, Poisson, Normal distributions. - Manipulating objects - data distribution.

## UNIT V

**DELIVERING RESULTS** :Documentation and deployment – producing effective presentations– Introduction to graphical analysis – plot() function – displaying multivariate data – matrix plots – multiple plots in one window - exporting graph - using graphics parameters in R Language. Case studies.

### Reference Books

- 1.Nina Zumel, John Mount, “Practical Data Science with R”, Manning Publications, 2014.
- 2.Jure Leskovec, Anand Rajaraman, Jeffrey D.Ullman, “Mining of Massive Datasets”, Cambridge University Press, 2014.
- 3.Mark Gardener, “Beginning R - The Statistical Programming Language”, John Wiley & Sons, Inc., 2012.
- 4.W. N. Venables, D. M. Smith and the R Core Team, “An Introduction to R”, 2013.
- 5.Tony Ojeda, Sean Patrick Murphy, Benjamin Bengfort, Abhijit Dasgupta, “Practical Data Science Cookbook”, Packt Publishing Ltd., 2014.
- 6.Nathan Yau, “Visualize This: The FlowingData Guide to Design, Visualization, and Statistics”, Wiley, 2011.
- 7.Boris lublinsky, Kevin t. Smith, Alexey Yakubovich, “Professional Hadoop Solutions”, Wiley, ISBN: 9788126551071, 2015.

### Student Activity:

1. **Collect data from any real time system and create clusters using any clustering algorithm**
2. **Read the student exam data in R perform statistical analysis on data and print results.**

### (Cluster 1) Paper-VIII: Elective –A-1 Foundations of Data Science Lab

#### Objectives :

- R is a well-developed, simple and effective programming language which includes conditionals, loops, user defined recursive functions and input and output facilities.
- R has an effective data handling and storage facility,
- R provides a suite of operators for calculations on arrays, lists, vectors and matrices.
- R provides a large, coherent and integrated collection of tools for data analysis.

#### Outcomes:

- 1) At end student will learn to handle the data through R.
- 2) Student will familiar with loading and unloading of packages.

## I. Installing R and R studio

## II. Basic Operations in r

1. Arithmetic Operations
2. Comments and spacing
3. Logical Operators - <, <=, >, >=, =, !=, &&, |

## III.

1. Getting data into R, Basic data manipulation
2. Vectors, Matrices, operation on vectors and matrices.

## IV.

1. Basic Plotting
2. Quantitative data
3. Frequency plots
4. Box plots
5. Scatter plot
6. Categorical data
7. Bar charts
8. Pie charts

## V. Loops and functions

1. if, if else, while, for break, next, repeat.
2. Basic functions- Print(), exp(), Log(), sqrt(), abs(), sin(), Cos(), tan(), factorial(), rand ().

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**III YEAR VI SEMESTER**  
**(Cluster 1) Paper-VIII : Elective –A-2**

**BIG DATA TECHNOLOGY**

**Course Objective**

The Objective of this course is to provide practical foundation level training that enables immediate and effective participation in big data projects. The course provides grounding in basic and advanced methods to big data technology and tools, including MapReduce and Hadoop and its ecosystem.

**Course Outcome**

1. Learn tips and tricks for Big Data use cases and solutions.
2. Learn to build and maintain reliable, scalable, distributed systems with Apache Hadoop.
3. Able to apply Hadoop ecosystem components.

**UNIT I**

**INTRODUCTION TO BIG DATA:**Introduction – distributed file system – Big Data and its importance, Four V's in bigdata, Drivers for Big data, Big data analytics, Big data applications. Algorithms using map reduce, Matrix-Vector Multiplication by Map Reduce.

**UNIT II**

**INTRODUCTION HADOOP :** Big Data – Apache Hadoop & Hadoop EcoSystem – Moving Data in and out of Hadoop – Understanding inputs and outputs of MapReduce - Data Serialization.

**UNIT- III**

**HADOOP ARCHITECTURE:** Hadoop Architecture, Hadoop Storage: HDFS, Common Hadoop Shell commands , Anatomy of File Write and Read., NameNode, Secondary NameNode, and DataNode, Hadoop MapReduce paradigm, Map and Reduce tasks, Job, Tasktrackers - Cluster Setup – SSH & Hadoop Configuration – HDFS Administering – Monitoring & Maintenance.



## **UNIT-IV**

**HIVE AND HIVEQL, HBASE:-**Hive Architecture and Installation, Comparison with Traditional Database, HiveQL - Querying Data - Sorting And Aggregating, Map Reduce Scripts, Joins & Subqueries,

## **UNIT-V**

HBase concepts- Advanced Usage, Schema Design, Advance Indexing - Zookeeper - how it helps in monitoring a cluster, HBase uses Zookeeper and how to Build Applications with Zookeeper.

### **Reference Books**

1. Boris lublinsky, Kevin t. Smith, Alexey Yakubovich, “Professional Hadoop Solutions”, Wiley, ISBN: 9788126551071, 2015.
2. Big Data Black Book( Covers Hadoop 2, Map Reduce, Hive, Yarn, Pig & Data Visualization)- Dream Tech Publications
3. Chris Eaton, Dirk deroos et al. , “Understanding Big data ”, McGraw Hill, 2012.
4. Tom White, “HADOOP: The definitive Guide” , O Reilly 2012.
5. Vignesh Prajapati, “Big Data Analytics with R and Haoop”, Packet Publishing 2013.
6. Tom Plunkett, Brian Macdonald et al, “Oracle Big Data Handbook”, Oracle Press, 2014.
7. Jy Liebowitz, “Big Data and Business analytics”, CRC press, 2013.

### **Student Activity:**

1. Collect real time data and justify how it has become Big Data
2. Reduce the dimensionality of a big data using your own map reducer

**III YEAR VI SEMESTER**  
**(Cluster 1) Paper-VIII : Elective –A-2**

**BIG DATA TECHNOLOGY LAB**

**Objectives :**

- Understand what Hadoop is
- Understand what Big Data is
- Learn about other open source software related to Hadoop

**Outcomes:**

- i) Get help on the various Hadoop commands
- ii) Observe a Map-Reduce job in action

1. Implement the following Data Structures in Java

- a) Linked Lists
- b) Stacks
- c) Queues
- d) Set
- e) Map

2. (i) Perform setting up and Installing Hadoop in its three operating modes: Standalone  
Pseudo distributed  
Fully distributed  
(ii) Use the web based tools to monitor your Hadoop setup.

3. Implement the following file management tasks in Hadoop.  
Adding files and directories  
Retrieving files  
Deleting files

**Structure of Computer Science/Information Technology (IT) Syllabus**

**III YEAR VI SEMESTER  
(Cluster 2) Paper-VIII : Elective –B-1**

**Distributed Systems**

**Course Objectives**

To expose the fundamentals of distributed computer systems, assuming the availability of facilities for data transmission.

To discuss multiple levels of distributed algorithms, distributed file systems, distributed databases, security and protection.

**Course Outcomes**

Create models for distributed systems.

Apply different techniques learned in the distributed system.

**UNIT I**

Introduction to Distributed Computing Systems, System Models, and Issues in Designing a Distributed Operating System, Examples of distributed systems.

**UNIT II**

Features of Message Passing System, Synchronization and Buffering, Introduction to RPC and its models, Transparency of RPC, Implementation Mechanism, Stub Generation and RPC Messages, Server Management, Call Semantics, Communication Protocols and Client Server Binding.

**UNIT III**

Introduction, Design and implementation of DSM system, Granularity and Consistency Model, Advantages of DSM, Clock Synchronization, Event Ordering, Mutual exclusion, Deadlock, Election Algorithms.

**UNIT IV**

Task Assignment Approach, Load Balancing Approach, Load Sharing Approach, Process Migration and Threads.

**UNIT V**

File Models, File Accessing Models, File Sharing Semantics, File Caching Schemes, File Replication, Atomic Transactions, Cryptography, Authentication, Access control and Digital Signatures.

### **Reference Books**

1. Pradeep. K. Sinha: “ Distributed Operating Systems: Concepts and Design ” , PHI, 2007.
2. George Coulouris, Jean Dollimore, Tim Kindberg: “ Distributed Systems” , Concept and Design, 3<sup>rd</sup> Edition, Pearson Education, 2005.

### **Student Activity**

1. Implementation of Distributed Mutual Exclusion Algorithm.
2. Create a Distributed Simulation Environment.

## **III YEAR VI SEMESTER (Cluster 2) Paper-VIII : Elective –B-1**

### **Distributed Systems Lab**

#### **Objective:**

It covers all the aspects of distributed system. It introduce its readers to basic concepts of middleware, states of art middleware technology

#### **Outcomes:**

1. Students will get the concepts of Inter-process communication
  2. Students will get the concepts of Distributed Mutual Exclusion and Distributed Deadlock Detection algorithm.
- 
1. To study client server based program using RPC.
  2. To study Client server based program using RMI.
  3. To study Implementation of Clock Synchronization (Logical/Physical)
  4. To study Implementation of Election algorithm.
  5. To study Implementation of Mutual Exclusion algorithms.
  6. To write program multi-threaded client/server processes.
  7. To write program to demonstrate process/code migration.

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**III YEAR VI SEMESTER  
(Cluster 2 ) Paper-VIII : Elective –B-2**

**Cloud Computing**

**Course Objectives:**

The student will learn about the cloud environment, building software systems and components that scale to millions of users in modern internet, cloud concepts capabilities across the various cloud service models including IaaS, PaaS, SaaS, and developing cloud based software applications on top of cloud platforms.

**Course Outcomes**

1. Compare the strengths and limitations of cloud computing
2. Identify the architecture, infrastructure and delivery models of cloud computing
3. Apply suitable virtualization concept.
4. Choose the appropriate cloud player , Programming Models and approach.
5. Address the core issues of cloud computing such as security, privacy and interoperability
6. Design Cloud Services and Set a private cloud

**Unit 1**

**Cloud Computing Overview** – Origins of Cloud computing – Cloud components - Essential characteristics – On-demand self-service , Broad network access , Location independent resource pooling , Rapid elasticity , Measured service

**Unit II**

Cloud scenarios – Benefits: scalability , simplicity , vendors ,security. Limitations – Sensitive information - Application development – Security concerns - privacy concern with a third party - security level of third party - security benefits Regularity issues: Government policies

**Unit III**

**Cloud architecture:** Cloud delivery model – SPI framework , SPI evolution  
**Software as a Service (SaaS):** SaaS service providers – Google App Engine, Salesforce.com and google platform – Benefits – Operational benefits - Economic benefits  
– Evaluating SaaS **Platform as a Service ( PaaS ):** PaaS service providers –Salesforce.com  
– Services and Benefits

## **Unit IV**

**Infrastructure as a Service ( IaaS):** IaaS service providers – Amazon EC2 , GoGrid —  
– Benefits

**Cloud deployment model :** Public clouds – Private clouds – Community clouds -  
Hybrid clouds - Advantages of Cloud computing

## **Unit V**

**Virtualization:** Virtualization and cloud computing - Need of virtualization – cost ,  
administration , fast deployment , reduce infrastructure cost - limitations

**Types of hardware virtualization:** Full virtualization - partial virtualization - para  
virtualization

**Desktop virtualization:** Software virtualization – Memory virtualization - Storage  
virtualization – Data virtualization – Network virtualization **Microsoft Implementation:**  
Microsoft Hyper V – Vmware features and infrastructure – Virtual Box - Thin client

## **Reference Books**

1. Cloud computing a practical approach - Anthony T.Velte , Toby J. Velte Robert  
Elsenpeter TATA McGraw- Hill , New Delhi - 2010
2. Cloud Computing: Web-Based Applications That Change the Way You Work and  
Collaborate Online - Michael Miller - Que 2008
3. Cloud Computing, Theory and Practice, Dan C Marinescu, MK Elsevier.
4. Cloud Computing, A Hands on approach, Arshadeep Bahga, Vijay Madiseti,  
University Press
5. Mastering Cloud Computing, Foundations and Application Programming, Raj  
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## **Student Activity:**

1. Prepare the list of companies providing cloud services category wise.
2. Create a private cloud using local server

## **III YEAR VI SEMESTER (Cluster 2 ) Paper-VIII : Elective –B-2**

### **Cloud Computing Lab**

#### **Outcomes: Learner will be able to...**

1. Appreciate cloud architecture
2. Create and run virtual machines on open source OS
3. implement Infrastructure , storage as a Service.

#### **Use Eucalyptus or Open Nebula or equivalent to set up the cloud and demonstrate.**

1. Find procedure to run the virtual machine of different configuration. Check how  
many virtual machines can be utilized at particular time.
2. Find procedure to attach virtual block to the virtual machine and check whether it  
holds the  
data even after the release of the virtual machine.
3. Install a C compiler in the virtual machine and execute a sample program.

4. Show the virtual machine migration based on the certain condition from one node to the other.
5. Find procedure to install storage controller and interact with it.

1. Introduction to cloud computing.
2. Creating a Warehouse Application in Sales Force.com.
3. Creating an Application in Sales Force.com using Apex programming Language.
4. Implementation of SOAP web services in C#/ JAVA Applications.
5. Implementation of Para- Virtualization using VM ware's workstation/  
Oracle's Virtual Box and Guest O.S.
6. Case study: PAAS ( Face book, Google App Engine)
7. Case Study: Amazon web services.

Adikavi Nannaya University  
**B.Sc. Computer Science/Information Technology (IT) Syllabus Under CBCS**  
w.e.f.2015-2016 (Modified in April 2016)  
**Structure of Computer Science/Information Technology (IT) Syllabus**

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**III YEAR VI SEMESTER**  
**(Cluster C) Paper-VIII : Elective –C-1**  
**Paper-VIII : PHP & MySQL, WordPress**

**Course Objectives**

To introduce the concept of PHP and to give basic Knowledge of PHP. Learn about PHP Syntax., Arrays, PHP Loops, PHP and MySQL connectivity, PHP form validation, PHP form handling. Overview of MySQL and PHPMyAdmin, Understand basic concepts of how a database stores information via tables, Understanding of SQL syntax used with MySQL, Learn how to retrieve and manipulate data from one or more tables, Know how to filter data based upon multiple conditions, Updating and inserting data into existing tables, Learning how the relationships between tables will affect the SQL, The advantages of store procedures with storing data using variables and functions, How SQL can be used with programming languages like PHP to create dynamic websites for visitors, Review of some sample PHP projects interacting with MySQL.

**Course Outcomes**

After completing this course satisfactorily, a student will be able to:

1. Introduction to web development with PHP
2. How to code a PHP application
3. Introduction to relational databases and MySQL
4. How to use PHP with a MySQL database
5. How to use the MVC pattern to organize your code
6. How to test and debug a PHP application
7. How to work with form data
8. How to code control statements
9. How to work with strings and numbers
10. How to work with dates
11. How to create and use arrays
12. How to work with cookies and sessions
13. How to create and use functions
14. How to use regular expressions, handle exceptions, and validate data

**UNIT I**

Installing and Configuring MySQL: Current and Future Versions of MySQL, How to Get MySQL, Installing MySQL on Linux, Windows, Trouble Shooting your Installation, Basic Security Guidelines, Introducing MySQL Privilege System, Working with User Privileges. Installing and Configuring Apache: Current and future versions of Apache, Choosing the Appropriate Installation Method, Installing Apache on Linux, Windows, Apache Configuration File Structure, Apache Log Files, Apache Related Commands, Trouble Shooting. Installing and Configuring PHP: Building PHP on Linux with Apache, Windows, php.ini. Basics, The Basics of PHP scripts. The Building blocks of PHP: Variables, Data Types, Operators and Expressions, Constants. Flow Control Functions in PHP: Switching Flow, Loops, Code Blocks and Browser Output.



## **UNIT II**

**Working with Functions:** What is function?, Calling functions, Defining Functions, Returning the values from User-Defined Functions, Variable Scope, Saving state between Function calls with the static statement, more about arguments.

**Working with Arrays:** What are Arrays? Arrays, Some Array-Related Functions.

**Working with Objects:** Creating Objects, Object Instance

**Working with Strings, Dates and Time:** Formatting strings with PHP, Investigating Strings with PHP, Manipulating Strings with PHP, Using Date and Time Functions in PHP.

## **UNIT III**

**Working with Forms:** Creating Forms, Accessing Form Input with User defined Arrays, Combining HTML and PHP code on a single Page, Using Hidden Fields to save state, Redirecting the user, Sending Mail on Form Submission, Working with File Uploads.

**Working with Cookies and User Sessions:** Introducing Cookies, Setting a Cookie with PHP, Session Function Overview, Starting a Session, Working with session variables, passing session IDs in the Query String, Destroying Sessions and Unsetting Variables, Using Sessions in an Environment with Registered Users. Working with Files

## **UNIT IV**

### **Introduction to MySQL**

**Understanding the Database Design Process:** The Importance of Good Database Design, Types of Table Relationships, and Understanding Normalization.

**Learning basic SQL Commands:** Learning the MySQL Data types, Learning the Table Creation Syntax, Using Insert Command, Using SELECT Command, Using WHERE in your Queries, Selecting from Multiple Tables, Using the UPDATE command to modify records, Using REPLACE Command, Using the DELETE Command, Frequently used string functions in MySQL, Using Date and Time Functions in MySQL.

## **UNIT V**

**Interacting with MySQL using PHP:** MySQL Versus MySQLi Functions, Connecting to MySQL with PHP, Working with MySQL Data. Creating an Online Address Book: Planning and Creating Database Tables, Creating Menu, Creating Record Addition Mechanism, Viewing Records, Creating the Record Deletion Mechanism, Adding Sub-entities to a Record.

**WordPress:** Introduction to WordPress, servers like wamp, bitnami etc, installing and configuring WordPress, understanding admin panel, working with posts and pages, using editor, text formatting with shortcuts. Customizing the site, changing the appearance of site using CSS.

## **REFERENCE BOOKS**

- 1. Julie C. Meloni, PHP MySQL and Apache, SAMS Teach yourself, Pearson Education (2007).**
- 2. Xue Bai Michael Ekedahl, The web warrior guide to Web Programming, Thomson (2006).**

### **Student activity:**

- 1. Creation of a webpage using wordpress**
- 2. Creation of student database of the college**

## PHP, MySQL & Wordpress LAB

### MySQL Lab Cycle

#### Cycle -1

An Enterprise wishes to maintain the details about his suppliers and other corresponding details. For that he uses the following details.

Suppliers (sid: Integer, sname: string, address: string)

Parts (pid: Integer, pname: string, color: string)

Catalog (sid: integer, pid: integer, cost: real)

**The catalog relation lists the prices charged for parts by suppliers.**

Write the following queries in SQL:

1. Find the pnames of parts for which there is some supplier.
2. Find the snames of suppliers who supply every part.
3. Find the snames of supplier who supply every red part.
4. Find the pnames of parts supplied by London Supplier and by no one else.
5. Find the sid's of suppliers who charge more for some part than the average cost of that part.
6. For each part, find the sname of the supplier who charges the most for that part.
7. Find the sid's of suppliers who supply only red parts.
8. Find the sid's of suppliers who supply a red and a green part.
9. Find the sid's of suppliers who supply a red or green part.
10. Find the total amount has to pay for that supplier by part located from London.

#### Cycle – 2

An organisation wishes to maintain the status about the working hours made by his employees. For that he uses the following tables.

Emp (eid: integer, ename: string, age: integer, salary: real)

Works (eid: integer, did: integer, pct\_time: integer)

Dept (did: integer, budget: real, managerid: integer)

An employee can work in more than one department; the pct\_time field of the works relation shows the percentage of time that a given employee works in a given department.

Resolve the following queries.

1. Print the names and ages of each employee who works in both Hardware and Software departments.
2. For each department with more than 20 full time equivalent employees (i.e., where the part-time and full-time employees add up to at least that many full-time employees), print the did's together with the number of employees that work in that department.
3. Print the name of each employee whose salary exceeds the budget of all of the departments that he or she work in.
4. Find the managerid's of managers who manage only departments with budgets greater than 1,000,000.
5. Find the enames of managers who manage the departments with largest budget.
6. If a manager manages more than one department, he or she controls the sum of all the budgets for those departments. Find the managerid's of managers who control more than 5,000,000.
7. Find the managerid's of managers who control the highest amount.
8. Find the average manager salary.

### **PHP Lab Cycle**

1. Write a PHP program to Display “Hello”
2. Write a PHP Program to display the today’s date.
3. Write a PHP Program to read the employee details.
4. Write a PHP Program to display the
5. Write a PHP program to prepare the student marks list.
6. Write a PHP program to generate the multiplication of two matrices.
7. Write a PHP Application to perform demonstrate the college website.
8. Write a PHP application to add new Rows in a Table.
9. Write a PHP application to modify the Rows in a Table.
10. Write a PHP application to delete the Rows from a Table.
11. Write a PHP application to fetch the Rows in a Table.
12. Develop an PHP application to make following Operations
  - i. Registration of Users.
  - ii. Insert the details of the Users.
  - iii. Modify the Details.
  - iv. Transaction Maintenance.
    - a) No of times Logged in
    - b) Time Spent on each login.
    - c) Restrict the user for three trials only.
    - d) Delete the user if he spent more than 100 Hrs of transaction.

### **WordPress Lab**

1. Installation and configuration of word press.
2. Create a site and add a theme to it.

(Cluster C) Paper-VIII: Elective –C-2

**Paper-VIII: Advanced Java Script (JQUERY /AJAX / JSON / Angular JS)**

**Course Objective:**

To impart knowledge in designing a webpage in a structured way by using advanced java script ie., using different scripting languages.

**Course Outcomes**

On completing the subject, students will be able to: create a dynamic website using advanced features of JavaScript and create a website with good and attractive design

**UNIT I**

**JQuery – Basics:** String, Numbers, Boolean, Objects, Arrays, Functions, Arguments, Scope, Built-in Functions. **jQuery – Selectors:** CSS Element Selector, CSS Element ID Selector, CSS Element Class Selector, CSS Universal Selector, Multiple Elements E, F, G Selector, Callback Functions. **jQuery – DOM Attributes:** Get Attribute Value, Set Attribute Value. **jQuery – DOM Traversing :** Find Elements by index, Filtering out Elements, Locating Descendent Elements, JQuery DOM Traversing Methods.

**UNIT II**

**jQuery – CSS Methods :** Apply CSS Properties, Apply Multiple CSS Properties, Setting Element Width & Height, JQuery CSS Methods. **jQuery – DOM Manipulation Methods:** Content Manipulation, DOM Element Replacement, Removing DOM Elements, Inserting DOM elements, DOM Manipulation Methods. **jQuery – Events Handling:** Binding event handlers, Removing event handlers, Event Types, The Event Object, The Event Attributes. **jQuery – Effects:** JQuery Effect Methods, jQuery Hide and Show, jQuery Toggle, jQuery Slide – slideDown, slideUp, slideToggle, jQuery Fade – fadeIn, fadeOut, fadeTo, jQuery Custom Animations

**UNIT III**

**Introduction to jQuery UI:** Need of jQuery UI in real web sites, Downloading jQuery UI, Importing jQuery UI, Draggable, Droppable, Resizable, Selectable, Sortable, Accordion, Auto Complete, Button Set, Date Picker, Dialog, Menu, Progress Bar, Slider, Spinner, Tabs, Tooltip. Intro to jQuery validation plug-in, Using jQuery validation plug-in, regular expressions.

**UNIT IV**

**Introduction to AJAX:** Need of AJAX in real web sites, Getting database data using jQuery-AJAX, Inserting, Updating, Deleting database data using jQuery-AJAX Grid Development using jQuery-AJAX

**Introduction to JSON:** JSON syntax, Need of JSON in real web sites, JSON object, JSON array, Complex JSON objects, Reading JSON objects using jQuery.

**UNIT V**

**Introduction to AngularJS:** Need of AngularJS in real web sites, Downloading AngularJS, AngularJS first example, AngularJS built-in directives, AngularJS expressions, AngularJS modules, AngularJS controllers, AngularJS scope, AngularJS registration form and login form, AngularJS CRUD operations, AngularJS Animations, AngularJS validations.

## **Reference Books**

1. jQuery UI 1.8: The User Interface Library for jQuery by Dan Wellman
2. jQuery Fundamentals by Rebecca Murphey
3. Ajax: The Complete Reference by Thomas A. Powell
4. Pro AngularJS by Adam Freeman Kindle Edition

## **Student Activity:**

1. Creation of website for a small scale company
2. Creation of website for a student database